REMARKS

In response to the above-identified Office Action, Applicants amend the Application and seek re-consideration in view of the following remarks. In this Response, Applicants amend claims 2-4 and 7-15, cancel claims 1 and 5 without prejudice, and add new claims 27 and 28. Claims 16-26 have been withdrawn. Accordingly, claims 2-4, 6-15, and 27-28 are pending in the Application.

I. Claims Rrejected Under 35 U.S.C. § 102

Claims 1-3 stand rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,094,930 issued to Zeng et. al (*Zeng*). Applicants have cancelled independent claim 1 without prejudice, and have added new independent claim 27, from which claims 2-3 have been amended to depend from. Applicants respectfully traverse the rejection of claims 2-3, at least in view of their dependence on claim 27.

To anticipate a claim, the cited reference must disclose each and every limitation of the rejected claim (*see* MPEP § 2131). Among other limitations, claims 2 and 3 (via their dependence from claim 27) define a vehicle thermal system comprising "a heating-ventilation-air conditioning (HVAC) unit including: a heater core in fluid communication with the cooling loop, and an evaporator in fluid communication with the heating loop and in thermal communication with the heater core" (emphasis added). Applicants submit that *Zeng* fails to disclose at least these limitations of claims 2 and 3.

In making the rejection, the Examiner alleges that *Zeng* discloses a system similar to the vehicle thermal system recited in claims 2 and 3. Applicants disagree. Applicants submit that *Zeng* discloses a system including a heat exchanger (reference numeral 88) that changes modes depending upon the operational mode of the system. That is, "...during the heating mode the inside heat exchanger 88 functions as a condenser transferring heat energy to air that passes through air-flow structure 52 into the passenger compartment and during cooling mode the inside heat exchanger 88 functions as an evaporator absorbing heat energy from the air that passes through air-flow structure

52 into the passenger compartment" (*Zeng*, Col. 4, lines 53-59 and FIG. 1). Applicants submit that a system including a heat exchanger performing both heating and cooling functions is not the same as a system including a heater core providing heating functions and an evaporator providing cooling functions.

One difference between *Zeng*'s system and Applicants' system relates to the efficiency of *Zeng*'s use of a single heat exchanger that functions as both an evaporator and a condenser verses Applicants' system which includes both an evaporator and a heater core in thermal communication with each other. When *Zeng*'s system is operating in its cooling mode, heat exchanger 88 generates heat and accumulates moisture because it is functioning as an evaporator. As Zeng's system changes into its heating mode (i.e., heat exchanger 88 begins functioning as a condenser), heat exchanger 88 still retains some of the heat and the moisture it accumulated when functioning as an evaporator. As one skilled in the art recognizes, a condenser does not function as efficiently as it otherwise could when it is cooling hot, humid air.

Similarly, when *Zeng*'s system changes from heating mode to cooling mode, heat exchanger 88 begins converting the hot, moist air it produced in the heating mode to cool, dry air, which further enhances the inefficiency of heat exchanger 88. As one skilled in the art recognizes, an evaporator does not function as efficiently as it otherwise could when it is drawing heat energy from cool, dry air.

By contrast, the system defined by claims 2 and 3 includes both an evaporator and a heater core in thermal communication with one another. Applicants' disclosure states:

> Blower fan 136 blows ventilation air over evaporator 138, which cools and dehumidifies the ventilation air. During the dehumidification process, heat from the blown ventilation air may be transferred into the evaporator 138 and into the refrigerant circulating through the evaporator 138. The cooled dehumidified ventilation air may be propelled further to cross over the heater core 140. Heater core 140 transfers heat into the cooled dehumidified ventilation air from the hot coolant circulating through the heater core 140. As will be seen in more detail below, heat transferred from the ventilation air into the refrigerant during dehumidification may be further transferred into the coolant and then back into the cooled dehumidified ventilation air. (Applicants' disclosure, paragraph [0014]).

That is, Applicants' evaporator draws heat energy and moisture from warm, humid air, which results in the air being cooler and de-humidified. The cooler, de-humidified air is transferred to Applicants' heater core, which heats and humidifies the cooler, de-humidified air. The newly heated and humidified air is then transferred back to the evaporator to start the process over again (which may also include new ventilation air).

Therefore, Applicants' evaporator uses hot, humid air to perform its cooling functions, which is the type of air that enables evaporators to function most efficiently. Similarly, Applicants' heater core uses cool, de-humidified air to perform its heating functions, which is the type of air that enables heater cores to function most efficiently. This symbiotic relationship simply cannot be achieved by the system disclosed in *Zeng*.

The failure of *Zeng* to disclose each and every limitation of claims 2 and 3 is fatal to the anticipation rejection. Therefore, claims 2 and 3 are not anticipated by *Zeng*. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 2 and 3.

II. Claims Rejected Under 35 U.S.C. § 103

A. Zeng in view of Derwent, Cummings et. al, or Voorhis

Claims 1-4 stand rejected under 35 U.S.C. 103(a) as being anticipated by *Zeng* in view of Derwent-Acc-no. 2003-164410 filed by Derwent ("*Derwent*"), U.S. Patent No. 5,966,960 issued to Cummings et. al ("*Cummings*"), or U.S. Patent No. 5,706,670 issued to Voorhis ("*Voorhis*"). Applicants have cancelled independent claim 1 without prejudice, and have added new independent claim 27, from which claims 2-4 depend. Applicants respectfully traverse the rejection of claims 2-4, at least in view of their dependence on new claim 27.

To render a claim obvious, the cited references must teach or suggest each and every limitation of the rejected claim (*see* MPEP § 2143). Among other limitations, claims 2-4 (via their dependence from claim 27) define a vehicle thermal system comprising "comprising "a heating-ventilation-air conditioning (HVAC) unit including: a heater core in fluid communication with the cooling loop, and an evaporator in fluid communication with the heating loop and in thermal communication with the heater core" (emphasis added). Applicants submit that the combination of *Zeng* and *Derwent*, *Zeng* and *Cummings,* or *Zeng* and *Voorhis* fails to teach or suggest at least these limitations of claims 2-4.

Applicants have addressed the shortcomings of *Zeng* above with respect to the anticipation rejection of claims 2 and 3, and submit that such discussion is equally applicable to an obviousness rejection of claims 2-3, and to claim 4 because claim 4 also depends from claim 27. The Examiner relies on the disclosure in *Derwent*, *Cummings*, or *Voorhis* to cure the defects of *Zeng*, however; Applicants submit that *Derwent*, *Cummings*, and *Voorhis* each fails to cure such defects.

In making the rejection, the Examiner characterizes each of *Derwent*, *Cummings*, and *Voorhis* as disclosing a bi-directional orifice (*see* Paper No./Mail Date 20060928, page 3). The Examiner does not cite *Derwent*, *Cummings*, or *Voorhis* for teaching or suggesting an HVAC unit including an evaporator and a heater core in thermal communication. In reviewing *Derwent*,

Cummings, and *Voorhis*, Applicants are unable to discern any sections of these references disclosing such limitations. Therefore, *Derwent*, *Cummings*, and *Voorhis* each fail to cure the defects of *Zeng*.

The failure of *Zeng*, *Derwent*, *Cummings*, and *Voorhis* to disclose each and every limitation of claims 2-4 is fatal to the obviousness rejection. Therefore, claims 2-4 are not obvious over *Zeng* in view of *Derwent*, *Zeng* in view of *Cummings*, or *Zeng* in view of *Voorhis*. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 2-4.

B. Zeng in view of Derwent, Cummings, or Voorhis, each in further view of Numazawa et. al

Claims 5-6 and 12-15 stand rejected under 35 U.S.C. 103(a) as being anticipated by *Zeng* in view of *Derwent* and U.S. Patent No. 5,497,941 issued to Numazawa et. al ("*Numazawa*"), *Zeng* in view of *Cummings* and *Numazawa*, or *Zeng* in view of *Voorhis* and *Numazawa*. Applicants have cancelled independent claim 1 and claim 5 without prejudice, and have added new independent claim 27, from which claim 6 depends. Applicants respectfully traverse the rejection of claim 6, at least in view of its dependence on new claim 27. Furthermore, Applicants respectfully traverse the rejection of claims 12-15, at least in view of the amendments to independent claim 12, from which claims 13-15 depend.

Claim 6 also depends from claim 27 and includes all of the limitations thereof. Therefore, Applicants submit that the discussion above regarding the combinations of *Zeng* and *Derwent*, *Zeng* and *Cummings*, and *Zeng* and *Voorhis* failing to teach or suggest each and every limitation of claims 2-4 is equally applicable to claim 6. The Examiner relies on the disclosure in *Numazawa* to cure the defects of each respective combination, however; Applicants submit that *Numazawa* fails to cure such defects.

In making the rejection, the Examiner characterizes *Numazawa* as showing a system that uses "the waste heat of engine coolant (passing through heat exchanger 11) to heat refrigerant to augment heating of the passenger compartment" (Paper No./Mail Date 20060928, page 4, parenthetical in

original). The Examiner does not cite *Numazawa* as teaching or suggesting an HVAC unit including an evaporator in fluid communication with a heating loop and a heater core in fluid communication with a cooling loop and in thermal communication with the evaporator. In reviewing *Numazawa*, Applicants are unable to discern any sections of *Numazawa* disclosing such limitations. Therefore, *Numazawa* fails to cure the defects of *Zeng*, *Derwent*, *Cummings*, and *Voorhis*.

The failure of *Zeng*, *Derwent*, *Cummings*, *Voorhis*, and *Numazawa* to disclose each and every limitation of claim 6 is fatal to the obviousness rejection. Therefore, claim 6 is not obvious over *Zeng* in view of *Derwent* and *Numazawa*, *Zeng* in view of *Cummings* and *Numazawa*, or *Zeng* in view of *Voorhis* and *Numazawa*. Accordingly, Applicants respectfully request withdrawal of the rejection of claim 6.

Regarding the rejection of claims 12-15, independent claim 12 (from which claims 13-15 depend), as amended, defines a reconfigurable vehicle thermal control system comprising "a reconfigurable cooling loop to selectively create one of a first cooling loop to cool a first component and a second cooling loop to cool a second component" (emphasis added). Applicants submit that the combination of *Zeng*, *Derwent*, and *Numazawa*; the combination of *Zeng*, *Cummings*, and *Numazawa*; and the combination *Zeng*, *Voorhis*, and *Numazawa* each fail to teach or suggest at least these elements of claims 12-15.

Applicants submit that *Zeng* and *Derwent* each disclose a system that includes only one cooling loop (*see Zeng*, FIG. 1; *Derwent*, Abstract), and certainly do not disclose "a reconfigurable cooling loop to selectively create one of a first cooling loop to cool a first component and a second cooling loop to cool a second component," as recited in claims 12-15. *Cummings* and *Voorhis* disclose a "bi-directional refrigerant expansion valve" and a "bidirectional metered flow control device," respectively, without reference to a cooling loop, let alone a reconfigurable cooling loop. The Examiner relies on the disclosure in *Numazawa* to cure the defects of *Zeng, Derwent, Cummings*, and *Voorhis*, however; Applicants submit that *Numazawa* fails to cure such defects.

Numazawa discloses "an air conditioning system for an automobile for controlling the temperature of a cabin of an automobile operated selectively by an electric motor or by an internal

combustion engine" (Col. 1, lines 13-16). *Numazawa*'s air conditioning system indeed cools the internal combustion engine (reference numeral 1); however, *Numazawa* does not disclose a system including a reconfigurable cooling loop to selectively create "a first cooling loop to cool a first component and a second cooling loop for cooling a second component" because *Numazawa* is primarily concerned with controlling the temperature of the automobile's cabin (*see* Abstract), not selectively cooling various components. By contrast, Applicants' system is capable of being reconfigured to provide multiple possible cooling loop combinations (*see* e.g., Applicants' FIG. 1, loops 191, 192, 193, and 194) to selectively cool various heat generating components (e.g., power train components, batteries, etc.). Therefore, *Numazawa* fails to cure the defects of *Zeng, Derwent, Cummings*, and *Voorhis*.

The failure of *Zeng*, *Derwent*, *Cummings*, *Voorhis*, and *Numazawa* to disclose each and every limitation of claims 12-15 is fatal to the obviousness rejection. Therefore, claims 12-15 are not obvious over *Zeng* in view of *Derwent* and *Numazawa*, *Zeng* in view of *Cummings* and *Numazawa*, or *Zeng* in view of *Voorhis* and *Numazawa*. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 12-15.

C. Zeng in view of Derwent, Cummings, or Voorhis, each combination in further view of Numazawa et. al, and Telesz or Knowles et. al

Claim 7 stands rejected 35 U.S.C. 103(a) as being anticipated by *Zeng* in view of *Derwent* and *Numazawa*, and in further view of U.S. Patent No. 6,606,879 issued to Telesz ("*Telesz*") or U.S. Patent No. 5,265,438 issued to Knowles et. al ("*Knowles*"); *Zeng* in view of *Cummings* and *Numazawa*, and in further view of *Telesz* or *Knowles*; and *Zeng* in view of *Voorhis* and *Numazawa*, and in further view of *Telesz* or *Knowles*.

Claim 7 defines a thermal system including "a reconfigurable refrigerant-based automotive air conditioning system to selectively create a plurality of possible refrigerant loops" (emphasis added). Applicants have discussed above the failure of *Zeng* in view of *Derwent* and *Numazawa*, *Zeng* in view of *Cummings* and *Numazawa*, or *Zeng* in view of *Voorhis* and *Numazawa* to teach or

suggest similar limitations recited in claims 12-15, and submit that such discussion is equally applicable to claim 7. The Examiner relies on the disclosure of *Telesz* or *Knowles* to cure the defects of *Zeng*, *Derwent*, *Cummings*, *Voorhis*, and *Numazawa*; however, Applicants submit that neither *Telesz* nor *Knowles* cures such defects.

The Examiner cites each of *Telesz* and *Knowles* as disclosing "a suction line accumulator" (Paper No./Mail Date 20060928, page 4). The Examiner does not cite *Telesz* or *Knowles* as disclosing "a reconfigurable refrigerant-based automotive air conditioning system to selectively create a plurality of possible refrigerant loops," as recited in claim 7. In reviewing both *Telesz* and *Knowles*, Applicants are unable to discern any sections of either *Telesz* or *Knowles* as disclosing such limitations. Accordingly, Applicants respectfully request withdrawal of the rejection of claim 7.

III. Amendments to Claims 8-11

Applicants note that the amendments to claims 8-11 are unrelated to patentability.

IV. Interview Summary

Applicants conducted an interview with the Examiner on January 22, 2007. Applicants and the Examiner agreed that the Office Action Summary and page 5 of the Office Action are inconsistent as to the status of claims 8-11. For clarification, the Examiner indicated that the Office Action does in fact object to claims 8-11 as being dependent upon a rejected base claim as recited on page 5, and does not reject claims 8-11 as indicated in the Office Action Summary.

V. Allowable Subject Matter

Applicants note with appreciation the Examiner's indication that claims 8-11 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. However, in view of the discussion above, Applicants believe that claims 8-11 are in condition for allowance as they currently stand.

CONCLUSION

In view of the foregoing, it is believed that all claims now pending are in condition for allowance. A Notice of Allowance is earnestly solicited at the earliest possible date. If the Examiner believes that a telephone conference would be useful in moving the application forward to allowance, the Examiner is encouraged to contact the undersigned at (480) 385-5060 or jgraff@ifllaw.com.

If necessary, the Commissioner is hereby authorized to charge payment or credit any overpayment to Deposit Account No. 50-2091 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17, particularly extension of time fees.

Respectfully submitted,

Date January 26, 2007

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